CLAIMS

What is claimed is:

1.   A method for calibrating a brake mechanism having an actuator, the actuator having a motor and being controlled through rotations of the motor, comprising:

initializing the brake mechanism;

applying a predetermined power level to the actuator;

establishing motor stall and responsively determining a reference motor position; and,

establishing a home motor position as a function of the second position and a predetermined constant.

2.   A method, as set forth in claim 1, further comprising establishing an initial motor position at initialization.

3.   A method, as set forth in claim 2, further comprising:

comparing a difference between the initial position and the reference motor position and a predetermined minimum value; and,

generating a signal if the difference is less than or equal to the predetermined minimum value.

4.   A method, as set forth in claim 3, the signal being indicative of a retained load condition.

5.   A method, as set forth in claim 1, further comprising:

storing a predetermined number of previous home position values; and,

calculating an average home position.

6.   A method, as set forth in claim 1, , the method further comprising:

defining a target motor position to deliver a predetermined force through the brake as a function of at least one of the reference position and the home motor position and a second predetermined constant;

generating command signals to the motor to move to the target position;

monitoring the command signals, and if excessive, generating an error signal; and,

after the target position has been reached, generating commands signals to the motor to move to the home position.

7.   A method, as set forth in claim 6, further comprising the step of generating a confirmation signal when the home position has been reached.

8.   A brake mechanism, comprising:

a brake operable to restrict movement of a vehicle;

an actuator having a motor and being coupled to the brake, the actuator being operable to selectively apply and release the brake; and,

a controller coupled to the actuator and being operable to initialize the brake mechanism and apply a predetermined power level to the actuator, to establish motor stall and responsively determine a reference motor position, and to establish a home motor position as a function of the second position and a predetermined constant.

9.   A brake mechanism, as set forth in claim 8, the controller further being operable to establish an initial motor position at initialization.

10.   A brake mechanism, as set forth in claim 9, the controller further being operable to compare a difference between the initial position and the reference motor position and a predetermined minimum value and to generate a signal if the difference is less than or equal to the predetermined minimum value.

11.   A brake mechanism, as set forth in claim 10, the signal being indicative of a retained load condition.

12.   A brake mechanism, as set forth in claim 8, the controller further being operable to store a predetermined number of previous home position values and to calculate an average home position.

13.   A brake mechanism, as set forth in claim 8, , the controller further being operable to define a target motor position to deliver a predetermined force through the brake as a function of at least one of the reference position and the home motor position and a second predetermined constant and generate command signals to the motor to move to the target position, to monitor the command signals, and if

excessive, generate an error signal and, after the target position has been reached, to generate commands signals to the motor to move to the home position.

14.   A brake mechanism, as set forth in claim 13, the controller further being operable to generate a confirmation signal when the home position has been reached.

15.   A program product for calibrating a brake mechanism having a brake coupled to an actuator, the actuator having a motor, the actuator being controlled through rotations of the motor, comprising:

program code means for initializing the brake mechanism;

program code means for applying a predetermined power level to the actuator;

program code means for establishing motor stall and responsively determining a reference motor position; and,

program code means for establishing a home motor position as a function of the second position and a predetermined constant.

16.   A program product, as set forth in claim 15, further comprising:

program code means for establishing an initial motor position at initialization;

program code means for comparing a difference between the initial position and the reference motor position and a predetermined minimum value; and,

program code means for generating a signal if the difference is less than or equal to the predetermined minimum value.

17.   A program product, as set forth in claim 15, , further comprising:

program code means for defining a target motor position to deliver a predetermined force through the brake as a function of at least one of the reference position and the home motor position and a second predetermined constant;

program code means for generating command signals to the motor to move to the target position;

program code means for monitoring the command signals and if excessive generate an error signal; and,

program code means for, after the target position has been reached, generating commands signals to the motor to move to the home position.

18.	A method for providing diagnostics for a brake mechanism having a brake coupled to an actuator, the actuator having a motor and being controlled through rotations of the motor, compromising:

establishing a current motor position;

incrementing power to the motor to achieve a target position;

determining power required to move motor to the target position when motor has reached the target position; and,

determining if the required power is outside of a predetermined power range.

19.	A method, as set forth in claim 18, further comprising determining if the brake mechanism is in a steady state condition, wherein the diagnostics are performed only if the brake mechanism is in the steady state condition.

20.	A method, as set forth in claim 18, further comprising determining if the current position is in a linear range of operation of the actuator, wherein the diagnostics are performed only if the current position is in the linear range.

21.	A method, as set forth in claim 18, wherein the target position (X_{N+M}) is determined by the equation, $X_{N+M} = X_N + M$, where X_N is the current motor position, M is a number of turns of the motor.

22.	A method, as set forth in claim 21, where M equals 1.

23.	A brake mechanism, comprising:

a brake operable to restrict movement of a vehicle;

an actuator having a motor and being coupled to the brake, the actuator being operable to selectively actuate and release the brake; and,

a controller coupled to the actuator and being operable to establish a current motor position, increment power to the motor to achieve a target position, and determine power required to move motor to the target position when motor has reached the target position and to determine if the required power is outside of a predetermined range.

24.	A brake mechanism, as set forth in claim 23, the controller further being operable to determine if the brake mechanism is in a steady state condition, the

diagnostics being performed only if the brake mechanism is in the steady state condition.

25.   A brake mechanism, as set forth in claim 23, the controller further being operable to determine if the current position is in a linear range of operation of the actuator, the diagnostics being performed only if the current position is in the linear range.

26.   A brake mechanism, as set forth in claim 23, wherein the target position (X_{N+M}) is determined by the equation, $X_{N+M} = X_N + M$, where X_N is the current motor position, M is a number of turns of the motor.

27.   A brake mechanism, as set forth in claim 26, where M equals 1.

28.   A program product for providing diagnostics for a brake mechanism having a brake coupled to an actuator, the actuator having a motor and being controlled through rotations of the motor, compromising:

program code means for establishing a current motor position;

program code means for incrementing power to the motor to achieve a target position;

program code means for determining power required to move motor to the target position when motor has reached the target position; and,

program code means for determining if the required power is outside of a predetermined power range.